

REMARKS

The rejection of Claims 1, 2, 4-6 and 13 under 35 U.S.C. § 102(b) as anticipated by US 4,855,276 (Osborne et al), is respectfully traversed. All the claims now contain the limitations of Claim 7, not subject to this rejection. Accordingly, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 1, 2, 4 and 12-13 under 35 U.S.C. § 102(e) as anticipated by US 6,649,082 (Hayasaka et al), is respectfully traversed. All the claims now contain the limitations of Claims 5-7, not subject to this rejection. Accordingly, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 1-13 under 35 U.S.C. § 103(a) as unpatentable over Hayasaka et al is respectfully traversed. Hayasaka et al is drawn to removing so-called harmful halogen-containing gas contained in an exhaust gas using a so-called harm-removing agent comprising a specific iron oxide, an alkaline earth metal compound and activated carbon (column 3, lines 2-7). However, Hayasaka et al neither discloses nor suggests a solid base which is sodium hydrogencarbonate and/or potassium hydrogencarbonate. By so restricting the solid base, since these materials are water-soluble, the amount of solid waste can be largely reduced, as described at page 24, line 25 to page 25, line 9 of the specification. Further, the use of such solid base materials results in CO<sub>2</sub> gas being formed upon reaction with an oxidizing gas such as HF or HCl, and the formed CO<sub>2</sub> gas will make the granules further porous, by which the reactivity will be improved. On the other and, in Hayasaka et al, alkaline earth metal compounds such as carbonates, oxides and hydroxides are disclosed, and only calcium hydroxide and strontium hydroxide are exemplified. Neither calcium hydroxide nor strontium hydroxide can form a porous material, and further, strontium hydroxide is expensive, such being disadvantageous. Further, as described at page 25, lines 10-27 of the specification, the hydrogencarbonate of sodium or potassium has a higher fire-extinguishing

property, and neutralization reaction of a hydrogencarbonate is generally an endothermic reaction, whereby there is no risk of firing, unlike calcium hydroxide, etc. Further, even if a carbonate such as calcium carbonate is used, it has a poor reactivity with the oxidizing gas unlike the sodium hydrogencarbonate, etc., used in the present invention, whereby such a carbonate will be used in a large amount, and since it is hardly dissolved in water, unreacted calcium carbonate will remain as residues, leading to the increase of costs for treatment of waste.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 1-13 under 35 U.S.C. § 103(a) as unpatentable over Osborne et al, optionally in view of Hayasaka et al and US 6,685,901 (Hirano et al), is respectfully traversed.

Osborne et al discloses an adsorbent composition for treating a fluid stream, such as removing chlorine gas from a gas stream (column 5, lines 43-45), using an adsorbent composition comprising from about 35-90% of activated alumina, from about 5-47% of high surface area carbon, and from about 5-30% of water (column 4, lines 39-43), wherein the adsorbent may also include sodium bicarbonate (column 4, lines 56-66). However, Osborne et al neither discloses nor suggests the presence of a porous material which is silica gel and/or zeolite having a particular average pore radius and pore volume. In the present invention, by incorporating such zeolite and/or silica gel, as described at page 15, lines 14-27 of the specification, halogen gas can easily reach deep into the granules, and the reactivity between the sodium hydrogencarbonate, etc. and the halogen gas will be increased, leading to improvement of reaction efficiency. On the other hand, while Osborne et al discloses that alumina may be used, it does not describe the specific pore properties of the present invention. Further, in the case of alumina, since it has no acid-resistance, it is easily corroded upon reaction with the oxidizing gas, whereby any pores will be broken and the reactivity

will be decreased. Further, zeolite and silica gel are very inexpensive compared to alumina (about 1/2 to 1/3), such being preferable from an industrial viewpoint.

While Hayasaka et al discloses treating with a zeolite after treating with their harm-removing agent (column 12, line 18ff), there is no disclosure or suggestion therein to combine the zeolite with their harm-removing agent. Similarly, there is no disclosure or suggestion in Hayasaka et al to combine a zeolite with the adsorbent composition of Osborne et al.

Hirano et al is relied on for its disclosure of granule hardness, but does not otherwise remedy the above-discussed deficiencies in the other applied prior art.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

Applicants respectfully submit that all of the presently-pending claims in this application are now in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

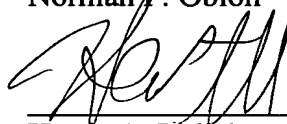
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